

FIGURE 1

AFP E1a and E1b Adenovirus Constructs

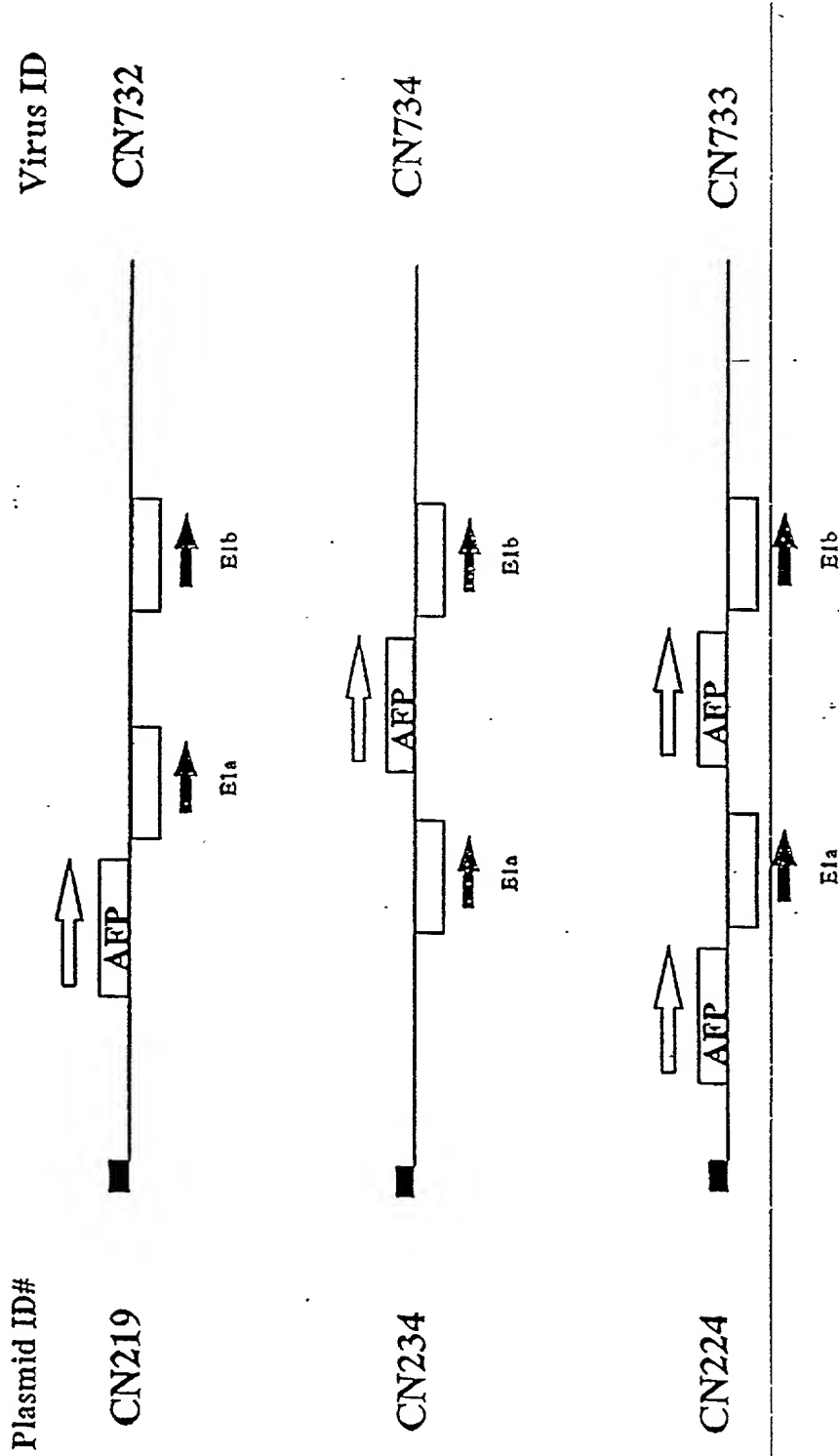


FIGURE 2A

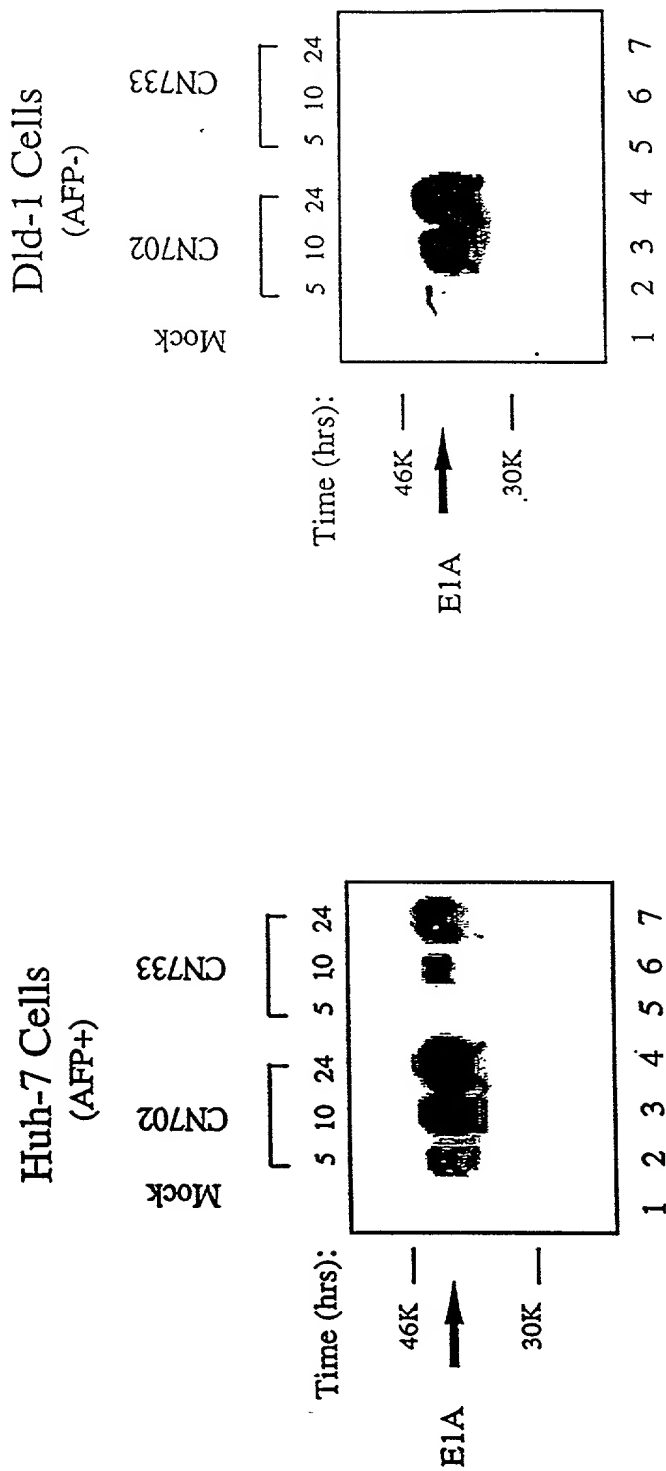


FIGURE 2B

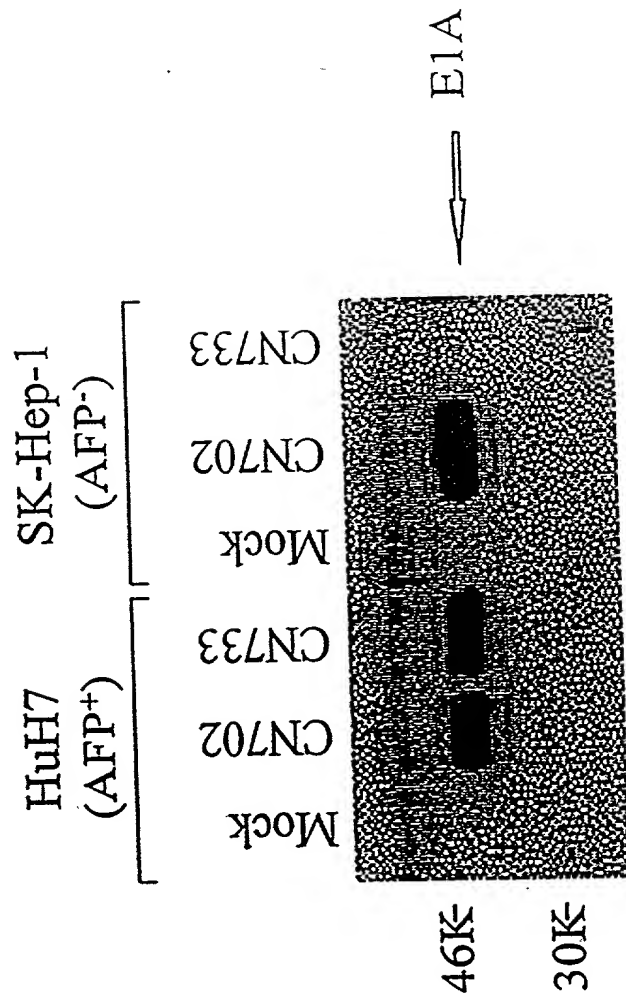


FIGURE 3A

Huh-7
(AFP+)

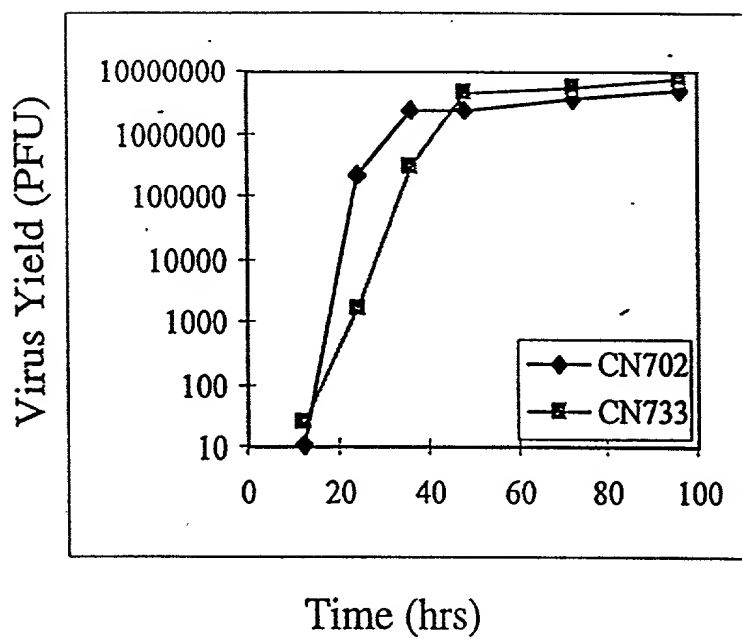


FIGURE 3B

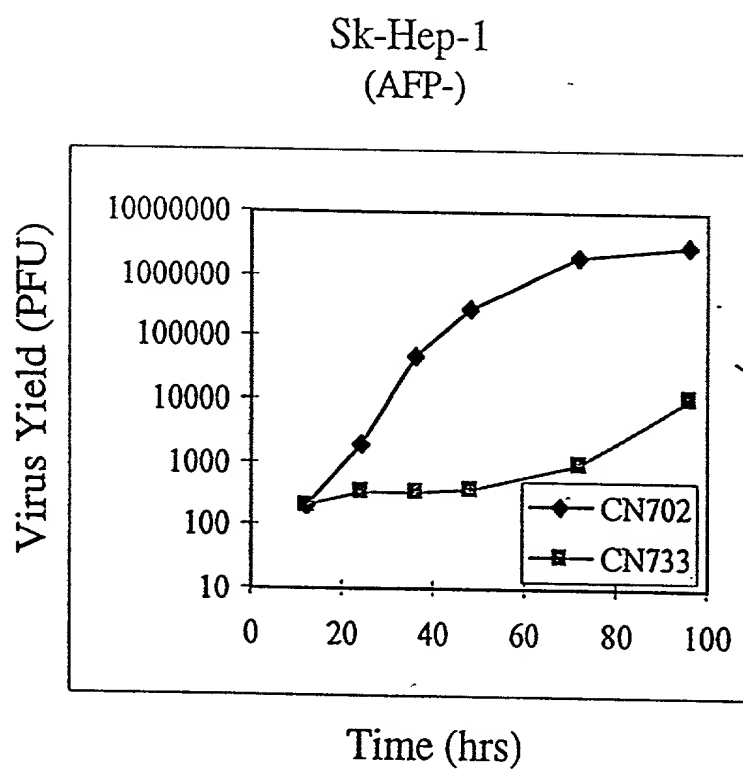


FIGURE 3C

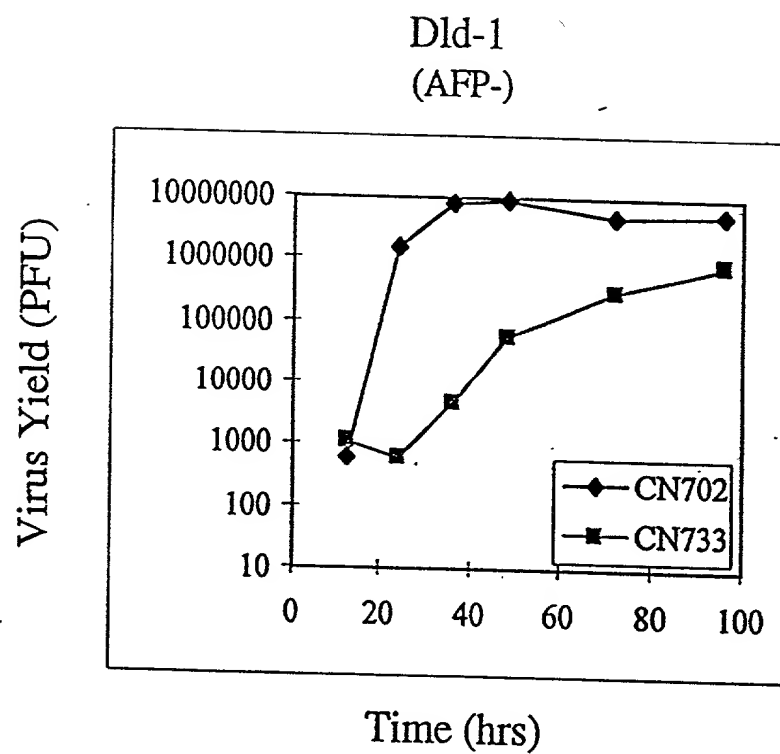


FIGURE 4A

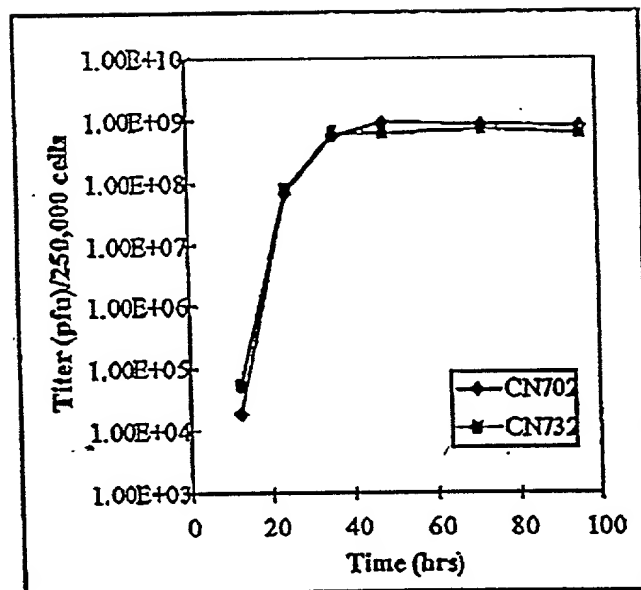


FIGURE 4B

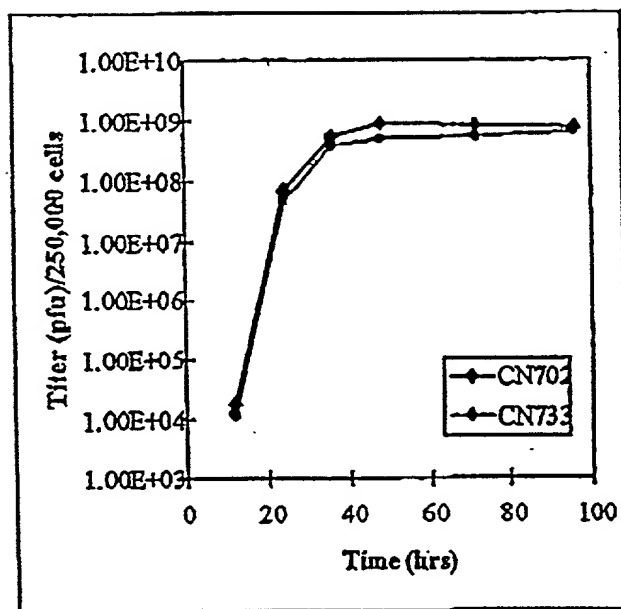


FIGURE 4C

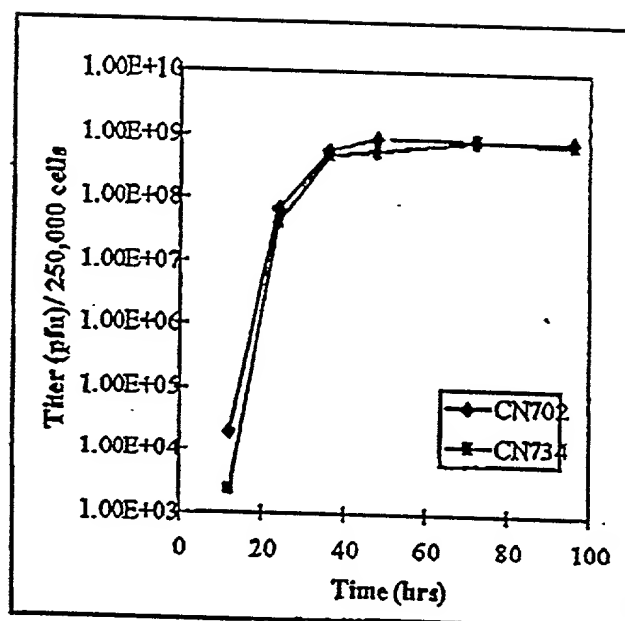


FIGURE 5A

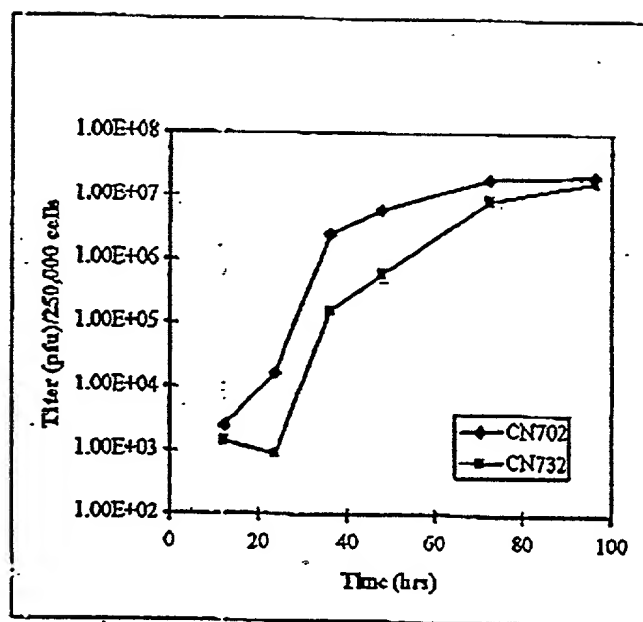


FIGURE 5B

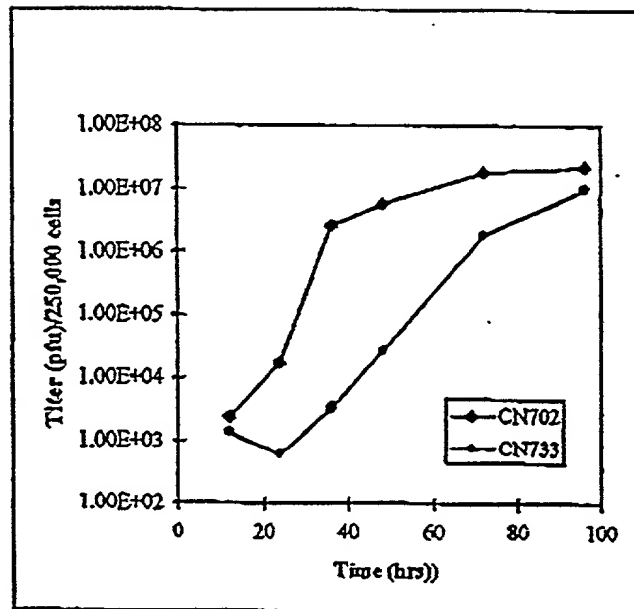


FIGURE 6A

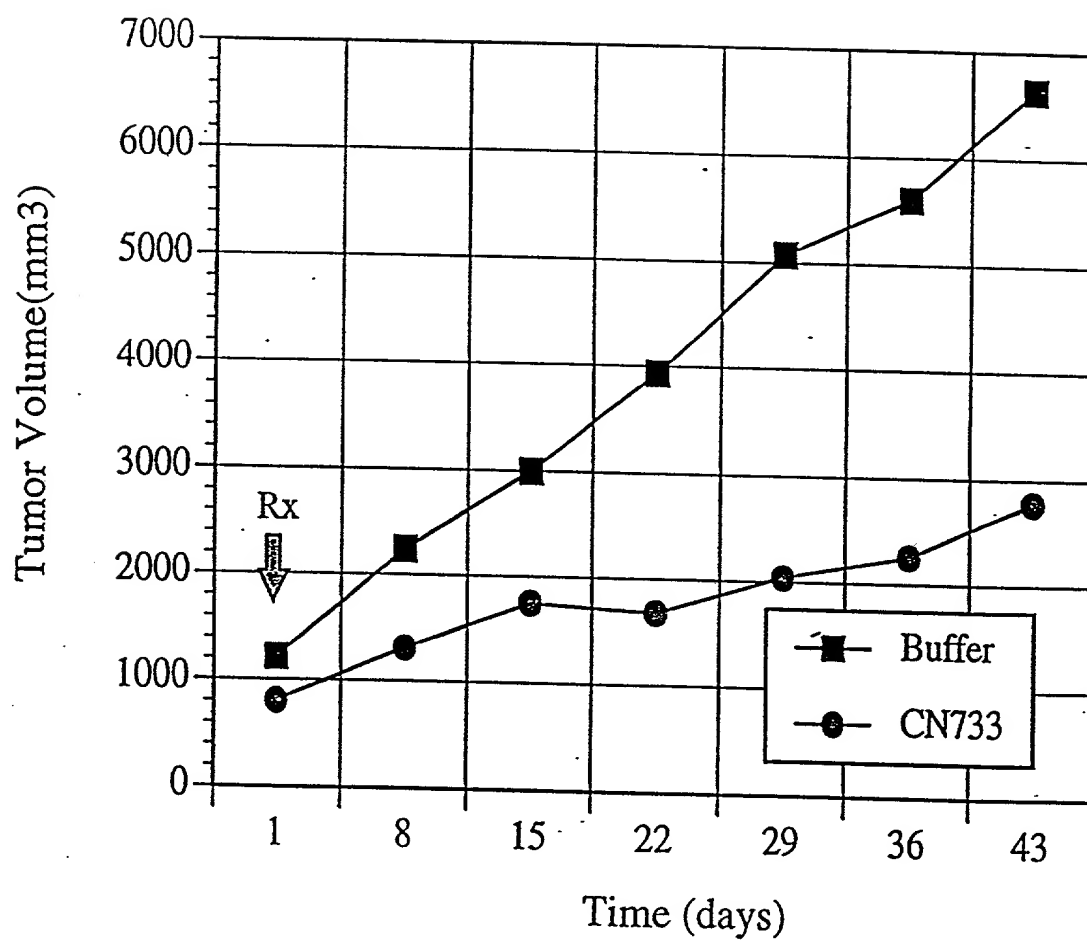
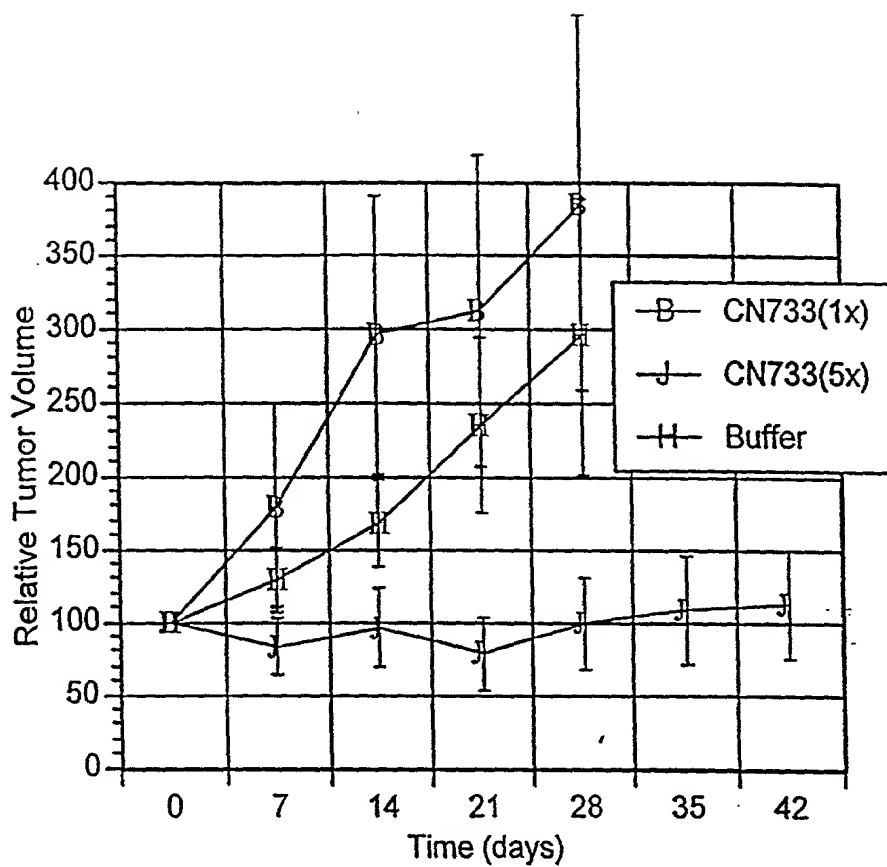


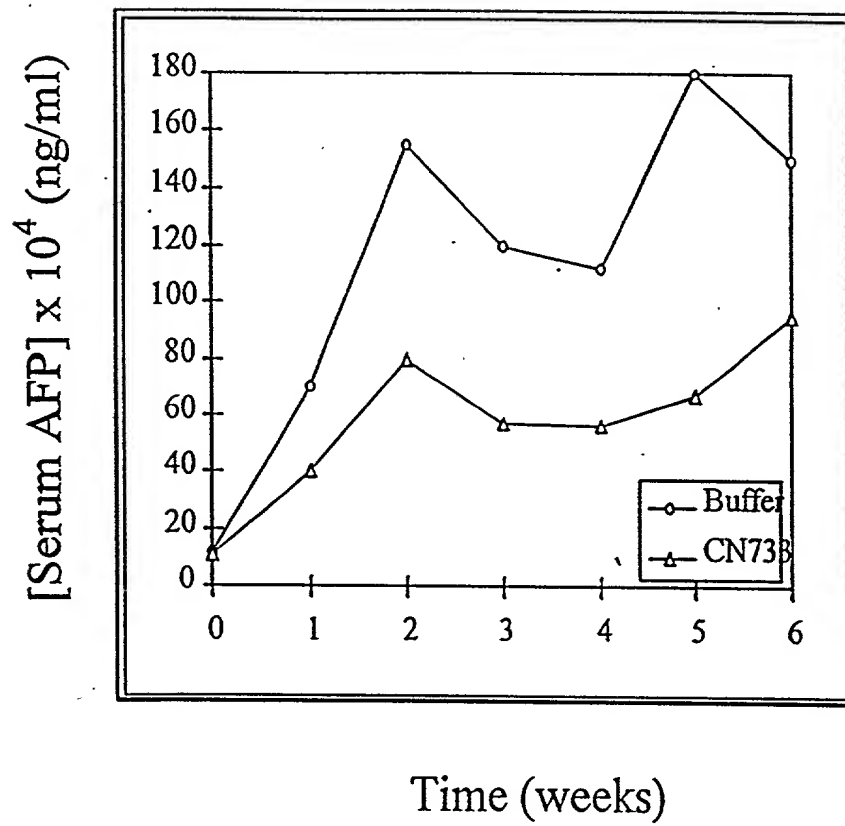
FIGURE 6B



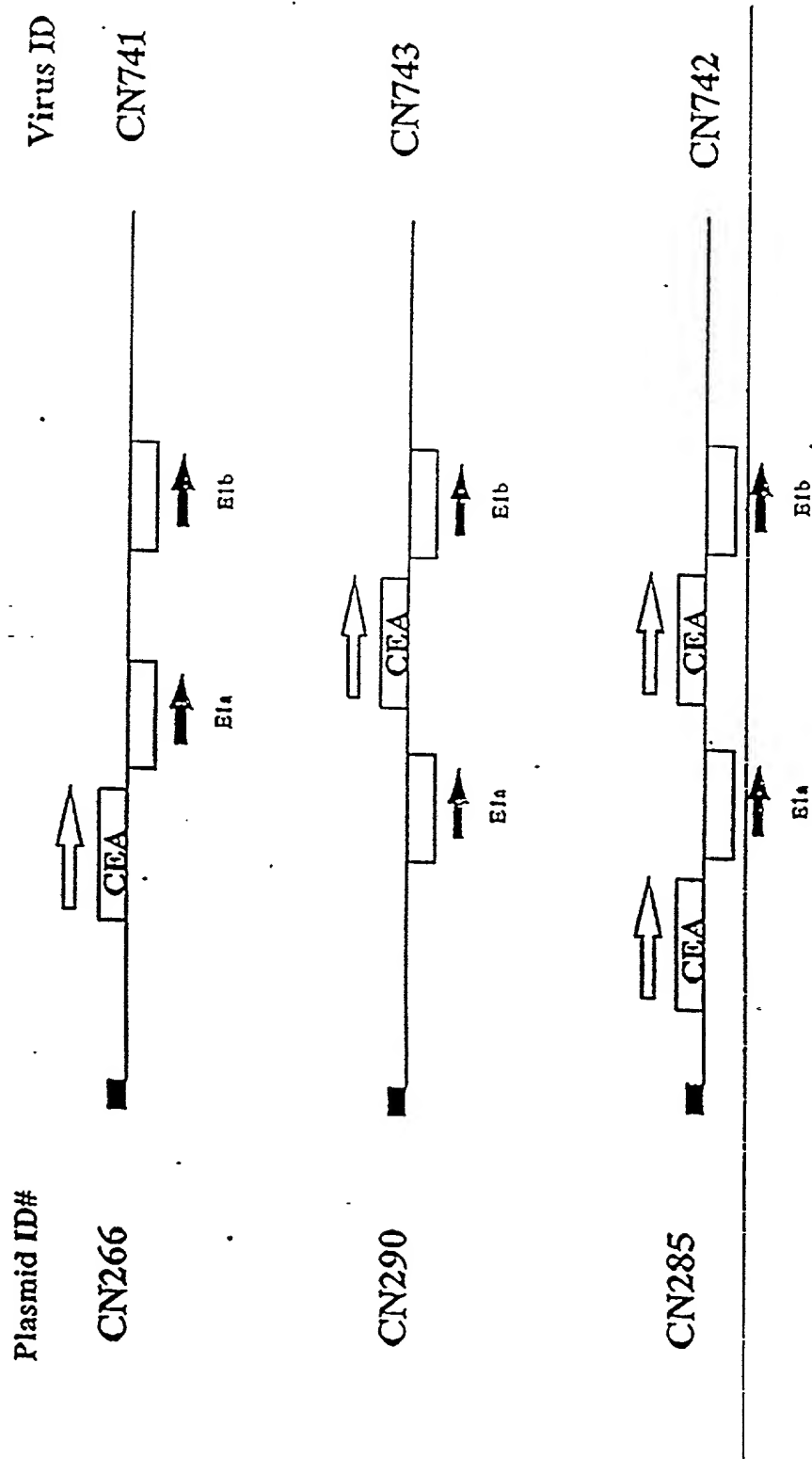
Error bars = standard error

Animals from groups treated with a single dose of CN733 and buffer were sacrificed at 28 days because of excessive tumor burden

FIGURE 7



CEA E1a and E1b Adenovirus Constructs



Plasmid ID#

Virus ID

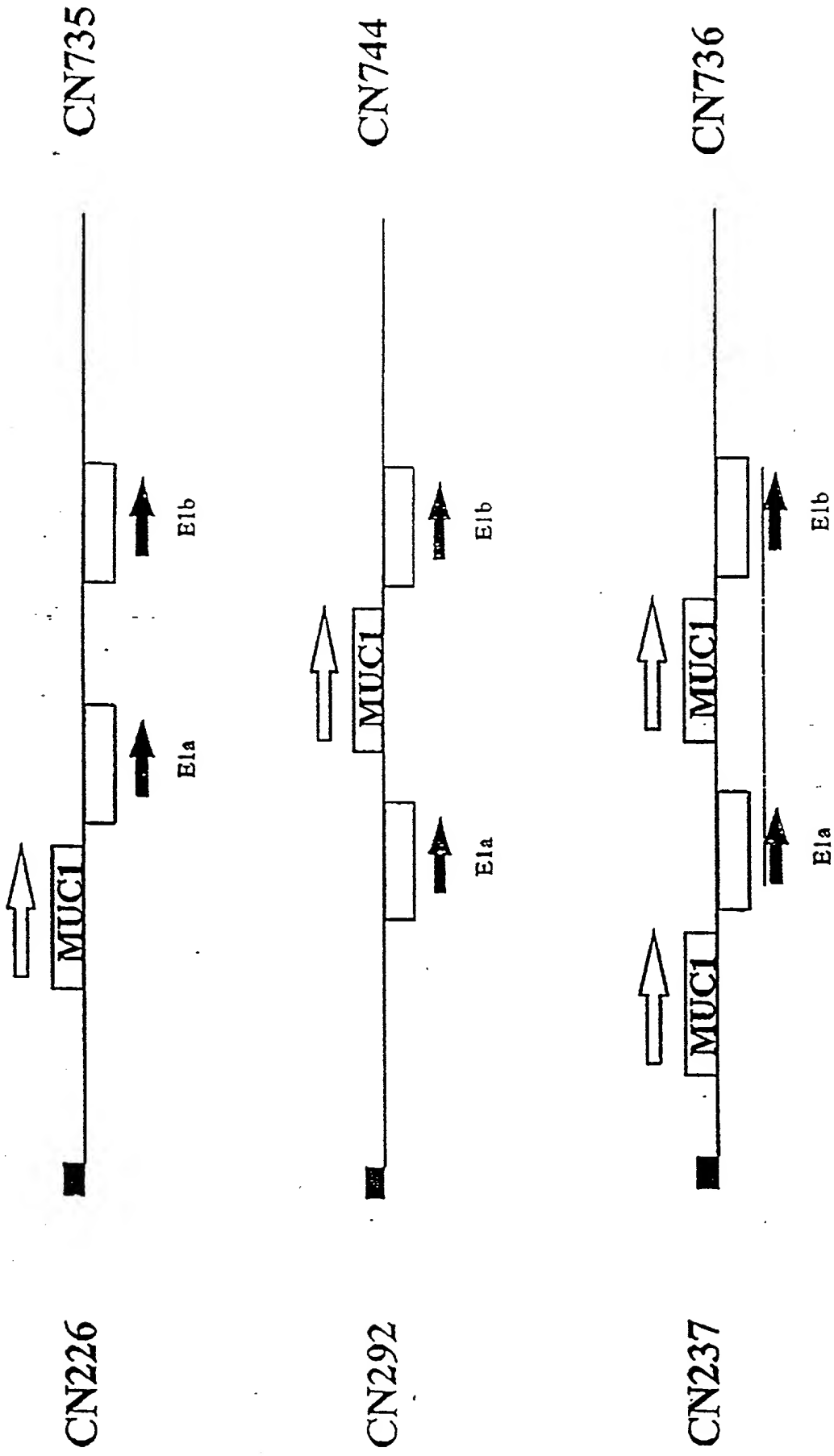


FIGURE 9

-426

5'-AAGCTTCCACAAGTGCATTTAGCCTCTCCAGTATTGCTGATGAATCCACAGT
TCAGGTTCAATGGCGTTCAAACTTGATCAAAAATGACCAGACTTTATATTCTTA
CACCAACATCTATCTGATTGGAGGAATGGATAATAGTCATCATGTTTAAACATCT
ACCATTCCAGTTAAGAAAAATATGATAGCATCTTGTCTTAGICTTTTTCTTAATA
ARE-1

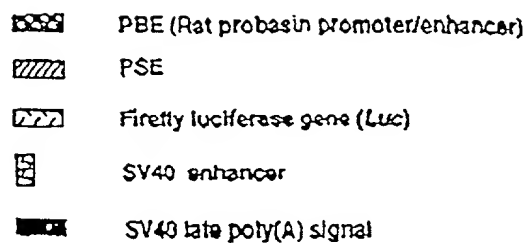
GGGACATAAAGCCCAAAATAAAAAATATGCCTGAAGAATGGGACAGGCATGG
GCATTGTCCATGCCTAGTAAAGTACTCCAAGAACCCTATTGTATACTAGATGACA
ARE-2

CAATGTCAATGTCTGTGTACAACTGCCAACTGGGATGCAAGACACTGCCCATG

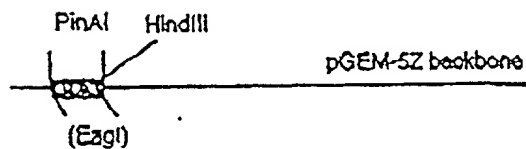
CAATCATCCTGAAAAGCAGCTATAAAAAGCAGGAAGCTACTCTGCACATT
CAAT box TATAA box +1 Transcription site

+28
GTCAGTGAGGTCCAGATACCTACAG-3'

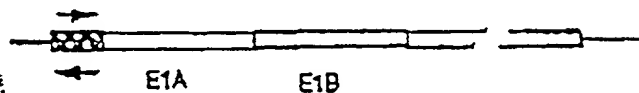
FIGURE 10



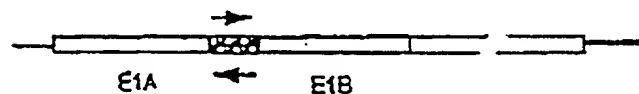
CN249
 (CN250)
 CN256
 CN271



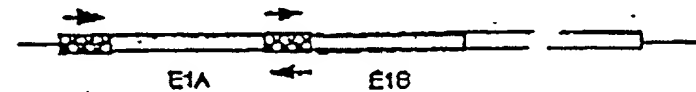
CN251
 CN253



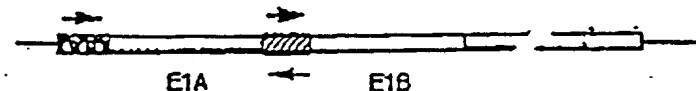
CN254 (CN275)
 CN255 (CN276)



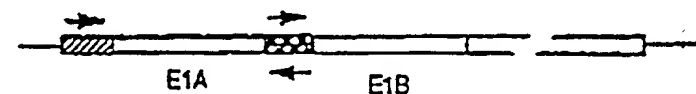
CN268
 CN269



CN257
 CN258



CN273
 CN274



CN280



CN281



FIGURE 11

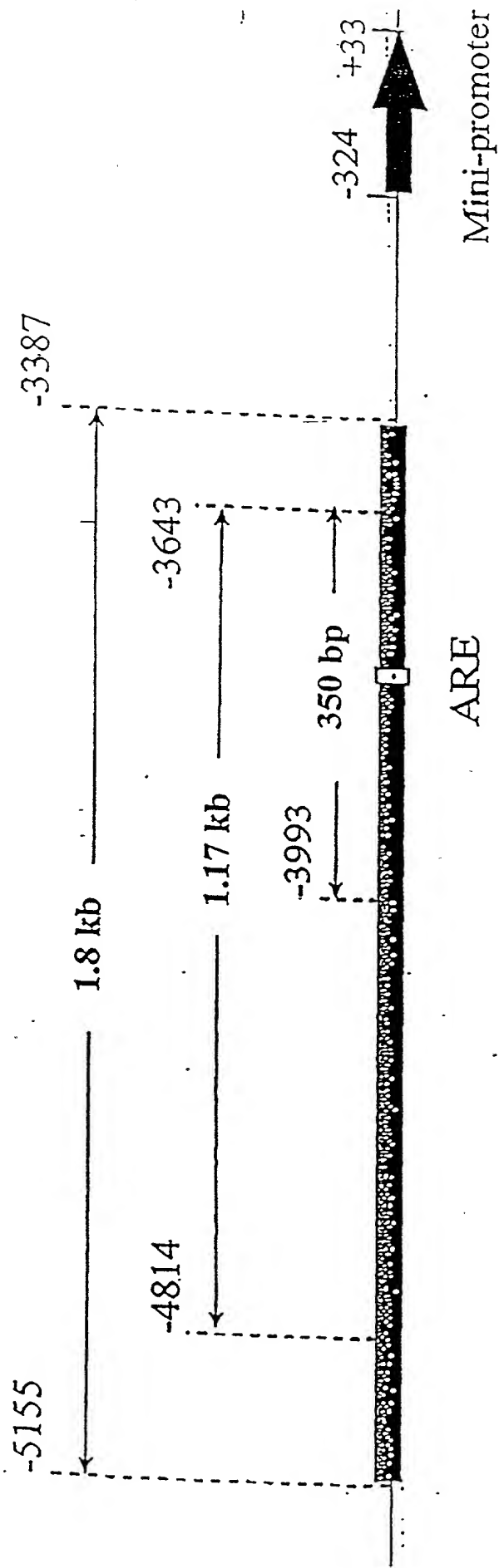


FIGURE 12

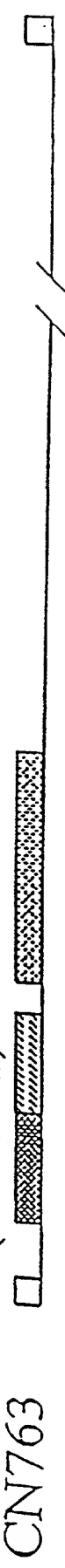
hKLK2 P



E1A E1B



hKLK2
(1.8 kb E + P)



hKLK2
(1.17 kb E + P)

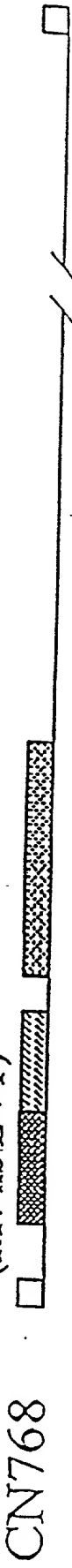


FIGURE 13

FIGURE 14A

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|------|
| aagcttttta | gtgctttaga | cagtgaactg | gtctgtctaa | cccaagtga | ctgggctcca | 60 |
| tactcagccc | cagaagtga | gggtgaagct | gggtggagcc | aaaccaggca | agcctaccct | 120 |
| cagggctccc | agtggcctga | gaaccattgg | accaggacc | cattacttct | agggtaagga | 180 |
| aggtacaaac | accagatcca | accatggtct | ggggggacag | ctgtcaaatg | cctaaaaata | 240 |
| tacctgggag | aggagcaggc | aaactatcac | tgccccaggt | tctctgaaca | gaaacagagg | 300 |
| ggcaacccaa | agtccaaatc | caggtgagca | ggtgcaccaa | atgccagag | atatgacgag | 360 |
| gcaagaagtg | aaggaaccac | ccctgcatca | aatgttttgc | atgggaagga | gaaggggggt | 420 |
| gctcatgttc | ccaatccagg | agaatgcatt | tgggatctgc | cttcttctca | ctccttggtt | 480 |
| agcaagacta | agcaaccagg | actctggatt | tggggaaaga | cgtttatattg | tggaggccag | 540 |
| tgatgacaat | cccacgaggg | cctaggtgaa | gagggcagga | aggctcgaga | cactggggac | 600 |
| tgagtgaana | ccacacccat | gatctgcacc | acccatggat | gtccttcat | tgctcacctt | 660 |
| tctgttgata | tcagatggcc | ccattttctg | taccttcaca | gaaggacaca | ggctagggtc | 720 |
| tgtgcatggc | cttcaccccc | ggggccatgt | gaggacagca | ggtgggaaag | atcatgggtc | 780 |
| ctcctgggtc | ctgcagggcc | agaacattca | tcaccatac | tgacctccta | gatgggaatg | 840 |
| gcttccctgg | ggctgggcca | acggggcctg | ggcaggggag | aaaggacgtc | aggggacagg | 900 |
| gaggaagggg | catcgagacc | cagcctggaa | ggttcttgtc | tctgaccatc | caggatttac | 960 |
| ttccctgcat | ctacctttgg | tcattttccc | tcagcaatga | ccagctctgc | ttcctgatct | 1020 |
| cagcctccca | ccctggacac | agcaccacag | tccttgcccc | ggctgcatcc | acccaatacc | 1080 |
| ctgataaacc | aggaccatt | acttctaggg | taaggagggt | ccaggagaca | gaagctgagg | 1140 |
| aaaggtctga | agaagtcaca | tctgtcctgg | ccagagggga | aaaaccatca | gatgctgaac | 1200 |
| caggagaatg | ttgaccacag | aaagggaccg | aggacccaag | aaaggagtca | gaccaccagg | 1260 |
| gtttgcctga | gaggaaggat | caaggccccg | agggaaagca | gggctggctg | catgtgcagg | 1320 |
| acactgggtg | ggcatatgtg | tcttagattc | tcctgaatt | cagtgtccct | gccatggcca | 1380 |
| gactctctac | tcaggcctgg | acatgctgaa | ataggacaat | ggccttgtcc | tctctcccca | 1440 |
| ccatttgga | agagacataa | aggacattcc | aggacatgcc | ttcctgggag | gtccagggtc | 1500 |
| tctgtctcac | acctcaggga | ctgtagttac | tgcatcagcc | atggtaggtg | ctgatctcac | 1560 |
| ccagcctgtc | caggcccttc | cactctccac | tttgtgacca | tgtccaggac | caccctcag | 1620 |
| atcctgagcc | tgcaataacc | cccttgctgg | gtgggtggat | tcagtaaaca | gtgagctcct | 1680 |

FIGURE 14B

| | | | | | | |
|------------|-------------|------------|------------|-------------|-------------|------|
| atccagcccc | cagagcoacc | tctgtcacct | tcctgctggg | catcatccca | ccttcacaag | 1740 |
| cactaaagag | catggggaga | cctggctagc | tgggtttctg | catcaciaag | aaaataatcc | 1800 |
| cccaggttcg | gattcccagg | gctctgtatg | tggagctgac | agacctgagg | ccaggagata | 1860 |
| gcagaggtca | gccctagggg | gggtgggtca | tccaccagg | ggacaggggt | gcaccagcct | 1920 |
| tgctactgaa | agggcctccc | caggacagcg | ccatcagccc | tgctgagag | ctttgctaaa | 1980 |
| cagcagtcag | aggaggccat | ggcagtggt | gagctcctgc | tccaggcccc | aacagaccag | 2040 |
| accaacagca | caatgcagtc | cttccccaac | gtcacaggtc | accaaaggga | aactgagggtg | 2100 |
| ctacctaac | ttagagccat | caggggagat | aacagcccaa | tttcccaaac | aggccagttt | 2160 |
| caatcccatg | acaatgacct | ctctgctctc | attcttccca | aaataggacg | ctgattctcc | 2220 |
| cccaccatgg | atttctccct | tgtcccgga | gccttttctg | ccccctatga | tctgggcact | 2280 |
| cctgacacac | acctctctc | tggtgacata | tcagggtccc | tcactgtcaa | gcagtccaga | 2340 |
| aaggacagaa | ccttgagacg | cgcccatctc | agcttcaccc | ttcctccttc | acagggttca | 2400 |
| gggcaaagaa | taaattggcag | aggccagtga | gccagagat | ggtgacaggc | agtgaccag | 2460 |
| gggcagatgc | ctggagcagg | agctggcggg | gccacaggga | gaaggatgatg | caggaaggga | 2520 |
| aaccagaaa | tgggcaggaa | aggaggacac | aggctctgtg | gggctgcagc | ccagggttgg | 2580 |
| actatgagtg | tgaagccatc | tcagcaagta | aggccaggtc | ccatgaacaa | gagtgggagc | 2640 |
| acgtggcttc | ctgctctgta | tatgggtggg | gggattccat | gccccataga | accagatggc | 2700 |
| cggggttcag | atggagaagg | agcaggacag | gggatcccca | ggataggagg | acccagtggt | 2760 |
| ccccaccag | gcagggtgact | gatgaatggg | catgcagggt | cctcctgggc | tgggctctcc | 2820 |
| ctttgtccct | caggattcct | tgaaggaaca | tccggaagcc | gaccacatct | acctggtggg | 2880 |
| ttctggggag | tccatgtaaa | gccaggagct | tgtgttgcta | ggaggggtca | tggcatgtgc | 2940 |
| tgggggcacc | aaagagagaa | acctgagggc | aggcaggacc | tggtctgagg | aggcatggga | 3000 |
| gccagatgg | ggagatggat | gtcaggaaag | gctgccccat | cagggagggt | gatagcaatg | 3060 |
| gggggtctgt | gggagtgggc | acgtgggatt | ccctgggctc | tgccaagtgc | cctcccatag | 3120 |
| tcacaacctg | gggacactgc | ccatgaaggg | gagcctttgc | ccagccagat | gctgctggtt | 3180 |
| ctgcccattc | actacctct | ctgtccagc | cactctgggt | ctttctccag | atgccctgga | 3240 |
| cagccctggc | ctgggcctgt | cccctgagag | gtgttgggag | aagctgagtc | tctggggaca | 3300 |
| ctctcatcag | agtctgaaag | gcacatcagg | aaacatccct | ggtctccagg | actaggcaat | 3360 |

FIGURE 14C

| | |
|--|------|
| gaggaaaggg cccagctcc tccctttgcc actgagaggg tcgaccctgg gtggccacag | 3420 |
| tgactttctgc gtctgtccca gtcaccctga aaccacaaca aaaccccagc cccagaccct | 3480 |
| gcaggtacaa tacatgtggg gacagtctgt acccagggga agccagttct ctcttcctag | 3540 |
| gagaccgggc ctcagggctg tgcccggggc aggcgggggc agcacgtgcc tgtccttgag | 3600 |
| aactcgggac ctttaaggtc tctgctctgt gaggcacagc aaggatcctt ctgtccagag | 3660 |
| atgaaagcag ctctgcccc tctctgacc tcttctcct tcccaaactc caaccaacaa | 3720 |
| ataggtgttt caaatctcat catcaaactc tcatccatcc acatgagaaa gcttaaaacc | 3780 |
| caatggattg acaacatcaa gagttggaac aagtggacat ggagatgtta cttgtggaaa | 3840 |
| tttagatgtg ttcagctatc gggcaggaga atctgtgtca aattccagca tggttcagaa | 3900 |
| gaatcaaaaa gtgtcacagt ccaaagtgc aacagtgcag gggataaaac tgtggtgcat | 3960 |
| tcaaactgag ggatattttg gaacatgaga aaggaagggg ttgtgtctgc acagaacatg | 4020 |
| gatgatctca cacatagagt tgaaagaaag gagtcaatcg cagaatagaa aatgatcact | 4080 |
| aattccacct ctataaagtt tccaagagga aaacccaatt ctgtgtctag agatcagaat | 4140 |
| ggaggtgacc tgtgccttgc aatggctgtg agggtcacgg gagtgtcact tagtgcaggc | 4200 |
| aatgtgccgt atcttaactc gggcagggct ttcatgagca cataggaatg cagacattac | 4260 |
| tgctgtgttc attttacttc accggaaaag aagaataaaa tcagccgggc gcggtggctc | 4320 |
| acgcctgtaa tcccagcact ttagaaggct gaggtgggca gattacttga ggtcaggagt | 4380 |
| tcaagaccac cctggccaat atggtgaaac cccggctcta ctaaaatac aaaaattagc | 4440 |
| tgggcatggt ggtgcgcgcc tgtaatccca gctactcggg aggctgaggc tggacaattg | 4500 |
| cttggaccca ggaagcagag gttgcagtga gccaagattg tgccactgca ctccagcttg | 4560 |
| ggcaacagag ccagactctg taaaaaaaaa aaaaaaaaaa aaaaaaagaa agaaagaaaa | 4620 |
| agaaaagaaa gtataaaatc tctttgggtt aacaaaaaaaa gatccacaaa acaaacacca | 4680 |
| gctcttatca aacttacaca actctgccag agaacaggaa acacaaatac tcattaactc | 4740 |
| acttttgtgg caataaaacc ttcattgtcaa aaggagacca ggacacaatg aggaagtaaa | 4800 |
| actgcaggcc ctacttgggt gcagagaggg aaaatccaca aataaaacat taccagaagg | 4860 |
| agctaagatt tactgcattg agttcattcc ccaggtatgc aagggtgattt taacacctga | 4920 |
| aatcaatca ttgcctttac tacatagaca gattagctag aaaaaaatta caactagcag | 4980 |
| aacagaagca atttggcctt cctaaaattc cacatcatat catcatgatg gagacagtgc | 5040 |
| agacgccaat gacaataaaa agagggacct ccgtcaccgg gtaaacatgt ccacacagct | 5100 |

FIGURE 14D

| | |
|--|------|
| ccagcaagca cccgtcttcc cagtgaatca ctgtaacctc ccctttaatc agccccaggc | 5160 |
| aaggctgcct gcgatggcca cacaggetcc aaccogtggg cctcaacctc ccgcagaggc | 5220 |
| tctccttttg ccacccccatg gggagagcat gaggacaggg cagagccctc tgatgcccac | 5280 |
| acatggcagg agctgacgcc agagccatgg gggctggaga gcagagctgc tggggtcaga | 5340 |
| gcttcctgag gacacccagg cctaaggga ggcagctccc tggatggggg caaccaggct | 5400 |
| ccgggctcca acctcagagc ccgcatggga ggagccagca ctctaggcct ttcctagggt | 5460 |
| gactctgagg ggacctgac acgacaggat cgtgtaatgc acccgagatg aaggggccac | 5520 |
| cacgggaccc tgctctcgtg gcagatcagg agagagtggg acaccatgcc agggccccc | 5580 |
| ggcatggctg cgactgaccc agggcactcc cctgcatgca tcagcctcgg taagtacat | 5640 |
| gaccaagccc aggaccaatg tggaaggga gaaacagcat cccctttagt gatggaaccc | 5700 |
| aaggctcagt caaagagagg ccatgagcag ttaggaaggg tggccaacc tacagcaca | 5760 |
| accatcatct atcataagta gaagccctgc tccatgaccc ctgcatttaa ataaacgttt | 5820 |
| gttaaagtga tcaaattccc tcccatgag agctcacctg tgtgtaggcc catcacacac | 5880 |
| acaaacacac acacacacac acacacacac acacacacac acagggaag tgcaggatcc | 5940 |
| tggacagcac caggcaggct tcacaggcag agcaaacagc gtgaatgacc catgcagtgc | 6000 |
| cctgggcccc atcagctcag agaccctgtg agggctgaga tggggctagg caggggagag | 6060 |
| acttagagag ggtggggcct ccaggggagg ggctgcaggg agctgggtac tgcctccag | 6120 |
| ggagggggct gcaggagct ggggtactgc ctccaggag ggggctgcag ggagctgggt | 6180 |
| actgcctcc agggaggggg ctgcaggag ctgggtactg ccctccaggg agggggctgc | 6240 |
| agggagctgg gtactgcct ccagggagc agggagcactg ttccaacag agagcacatc | 6300 |
| ttcctgcagc agctgcacag acacaggagc ccccatgact gccctgggcc aggggtgtga | 6360 |
| ttccaaattt cgtgccccat tgggtgggac ggaggttgac cgtgacatcc aaggggcatc | 6420 |
| tgtgattcca aacttaaact actgtgccta caaatagga aataacccta ctttttctac | 6480 |
| tatctcaaat tccctaagca caagctagca ccctttaaat caggaagttc agtcactcct | 6540 |
| ggggtcctcc catgccccca gtctgacttg caggtgcaca ggggtggctga catctgtcct | 6600 |
| tgctcctcct cttggctcaa ctgccgcccc tctgggggt gactgatggt caggacaagg | 6660 |
| gatcctagag ctggccccat gattgacagg aaggcaggac ttggcctcca ttctgaagac | 6720 |
| taggggtgtc aagagagctg ggcacccac agagctgcac aagatgacgc ggacagaggg | 6780 |

FIGURE 14E

| | |
|--|------|
| tgacacaggg ctcagggctt cagacgggtc gggaggctca gctgagagtt cagggacaga | 6840 |
| cctgaggagc ctcagtggga aaagaagcac tgaagtggga agttctggaa tgttctggac | 6900 |
| aagcctgagt gctctaagga aatgctccca ccccgatgta gcctgcagca ctggacggtc | 6960 |
| tgtgtacctc cccgctgccc atcctctcac agccccgcc tctagggaca caactcctgc | 7020 |
| cctaacatgc atctttctctg tctcattcca cacaaaagg cctctgggggt cctgttctg | 7080 |
| cattgcaagg agtggaggtc acgttcccac agaccacca gcaacagggt cctatggagg | 7140 |
| tgcggtcagg aggatcacac gtccccccac gcccagggga ctgactctgg gggatgatga | 7200 |
| ttggcctgga ggccactgggt cccctctgtc cctgagggga atctgcaccc tggaggctgc | 7260 |
| cacatccctc ctgattcttt cagctgaggg cccttcttga aatcccaggg aggactcaac | 7320 |
| ccccactggg aaaggcccag tgtggacgggt tccacagcag ccagcctaag gcccttggac | 7380 |
| acagatcctg agtgagagaa cctttagggg cacagggtgca cggccatgtc ccagtgccc | 7440 |
| acacagagca ggggcatctg gaccctgagt gtgtagctcc cgcgactgaa ccagccctt | 7500 |
| ccccaatgac gtgaccctg ggggtggctcc aggtctccag tccatgccac caaaatctcc | 7560 |
| agattgaggg tcttcccttg agtccctgat gcctgtccag gagctgcccc ctgagcaaat | 7620 |
| ctagagtgca gagggtctggg attgtggcag taaaagcagc cacatttgtc tcaggaagga | 7680 |
| aaggaggagc atgagctcca ggaagggcga tggcgtcctc tagtgggccc ctctgttaa | 7740 |
| tgagcaaaaa ggggccagga gagttgagag atcagggctg gccttggact aaggctcaga | 7800 |
| tggagaggac tgaggtgcaa agagggggct gaagtagggg agtggtcggg agagatggga | 7860 |
| ggagcaggta aggggaagcc ccagggaggc cgggggaggg tacagcagag ctctccactc | 7920 |
| ctcagcattg acatttgggg tggctgtgct agtgggggtc tgtaagttgt aggggtgtca | 7980 |
| gcaccatctg gggactctac ccactaaatg ccagcaggac tccctcccca agctctaaca | 8040 |
| accaacaatg tctccagact ttocaaatgt cccctggaga gcaaaattgc ttctggcaga | 8100 |
| atcactgatc tacgtcagtc tctaaaagtg actcatcagc gaaatccttc acctcttggg | 8160 |
| agaagaatca caagtgtgag aggggtagaa actgcagact tcaaaatctt tccaaaagag | 8220 |
| ttttacttaa tcagcagttt gatgtcccag gagaagatac atttagagtg tttagagttg | 8280 |
| atgccacatg gctgcctgta cctcacagca ggagcagagt gggttttcca agggcctgta | 8340 |
| accacaactg gaatgacact cactgggtta cattacaaag tggaatgtgg ggaattctgt | 8400 |
| agactttggg aagggaatg tatgacgtga gccacagcc taaggcagtg gacagtccac | 8460 |
| tttgaggctc tcaccatcta ggagacatct cagccatgaa catagccaca tctgtcatta | 8520 |

FIGURE 14F

| | |
|--|-------|
| gaaaacatgt tttattaaga ggaaaaatct aggctagaag tgctttatgc tcttttttct | 8580 |
| ctttatgttc aaattcatat acttttagat cattccttaa agaagaatct atccccctaa | 8640 |
| gtaaatgtta tcaactgactg gatagtgttg gtgtctcact cccaaccctt gtgtggtgac | 8700 |
| agtgccctgc ttccccagcc ctgggcoctc tctgattcct gagagctttg ggtgctcctt | 8760 |
| cattaggagg aagagaggaa ggggtgtttt aatattctca ccattcaccc atccacctct | 8820 |
| tagacactgg gaagaatcag ttgcccactc ttggatttga tctctgaatt aatgacctct | 8880 |
| atttctgtcc cttgtccatt tcaacaatgt gacaggccta agaggtgcct tctccatgtg | 8940 |
| atttttgagg agaaggttct caagataagt tttctcacac ctctttgaat tacctccacc | 9000 |
| tgtgtcccca tcaccattac cagcagcatt tggacccttt ttctgttagt cagatgcttt | 9060 |
| ccacctcttg aggggtgtata ctgtatgctc tctacacagg aatatgcaga ggaaatagaa | 9120 |
| aaagggaaat cgcattacta ttcagagaga agaagacctt tatgtgaatg aatgagagtc | 9180 |
| taaaatccta agagagccca tataaaatta ttaccagtgc taaaactaca aaagttacac | 9240 |
| taacagtaaa ctagaataat aaaacatgca tcacagttgc tggtaaagct aaatcagata | 9300 |
| tttttttctt agaaaaagca ttccatgtgt gttgcagtga tgacaggagt gcccttcagt | 9360 |
| caatatgctg cctgtaattt ttgttccctg gcagaatgta ttgtcttttc tccctttaa | 9420 |
| tcttaaattgc aaaactaaag gcagctcctg ggccccctcc ccaaagtcag ctgcctgcaa | 9480 |
| ccagccccac gaagagcaga ggcctgagct tccctggcga aaataggggg ctagggagct | 9540 |
| taaccttgct cgataaagct gtgttcccag aatgtcgtc ctgttcccag gggcaccagc | 9600 |
| ctggaggggtg gtgagcctca ctggtggcct gatgcttacc ttgtgccctc acaccagtgg | 9660 |
| tcaactggaac cttgaacact tggctgtcgc ccgatctgc agatgtcaag aacttctgga | 9720 |
| agtcaaatta ctgccactt ctccaggga gatactgtg aacatccaaa accatgccac | 9780 |
| agaaccctgc ctgggggtcta caacacatat ggactgtgag caccaagtcc agccctgaat | 9840 |
| ctgtgaccac ctgccaagat gccctaact gggatccacc aatcactgca catggcaggc | 9900 |
| agcgaggctt ggaggtgctt cgccacaagg cagccccaat ttgctgggag tttcttgga | 9960 |
| cctggtagtg gtgaggagcc ttgggaccct caggattact ccccttaagc atagtggga | 10020 |
| cccttctgca tccccagcag gtgccccgct cttcagagcc tctctctctg aggtttaccc | 10080 |
| agaccctgc accaatgaga ccatgctgaa gcctcagaga gagagatgga gctttgacca | 10140 |
| ggagccgctc ttccttgagg gccagggcag ggaaagcagg aggcagcacc aggagtggga | 10200 |

FIGURE 14G

| | |
|---|-------|
| acaccagtgt ctaagcccct gatgagaaca ggggtggtctc tcccatatgc ccataaccagg | 10260 |
| cctgtgaaca gaatcctcct tctgcagtga caatgtctga gaggacgaca tgtttccag | 10320 |
| cctaacgtgc agccatgccc atctaccacac tgcctactgc aggacagcac caaccaggga | 10380 |
| gctgggaagc tgggagaaga catggaatac ccatggcttc tcaccttctt ccagtcaggt | 10440 |
| gggcaccatt tatgcctagg acaccacact gcgggccccca ggctcttaag agttaggtca | 10500 |
| cctaggtgcc tctgggaggc cgaggcagga gaattgcttg aaccggggag gcagagggtg | 10560 |
| cagtgaagcg agatcacacc actgcactcc agcctgggtg acagaatgag actctgtctc | 10620 |
| aaaaaaaaag agaaagatag catcagtggc taccaagggc taggggcagg ggaaggtgga | 10680 |
| gagttaatga ttaatagtat gaagtttcta tgtgagatga tgaaaatgtt ctggaaaaaa | 10740 |
| aaatatagtg gtgaggatgt agaataattgt gaatataatt aacggcattt aattgtacac | 10800 |
| ttaacatgat taatgtggca tattttatct tatgtatttg actacatcca agaaacactg | 10860 |
| ggagagggaa agcccaccat gtaaaataca cccaccctaa tcagatagtc ctcatgttac | 10920 |
| ccaggtacag gcccctcatg acctgcacag gaataactaa ggattttaagg acatgaggct | 10980 |
| tcccagccaa ctgcaggtgc acaacataaa tgtatctgca aacagactga gagtaaagct | 11040 |
| gggggcacaa acctcagcac tgccaggaca cacacccttc tctgtgattc tgactttatc | 11100 |
| tgaccgggcc cactgtccag atcttgttgt gggattggga caaggagggt cataaagcct | 11160 |
| gtccccaggc cactctgtgt gagcacacga gacctccca cccccacc gttaggtctc | 11220 |
| cacacataga tctgaccatt aggcattgtg aggaggactc tagcgcgggc tcagggatca | 11280 |
| caccagagaa tcaggtacag agaggaagac ggggctcgag gagctgatgg atgacacaga | 11340 |
| gcagggttcc tgcagtccac aggtccagct caccctggtg taggtgcccc atccccctga | 11400 |
| tccaggcatc cctgacacag ctccctcccg gagcctctc ccaggtgaca catcagggtc | 11460 |
| cctcactcaa gctgtccaga gagggcagca ccttggacag cgcccacccc acttcactct | 11520 |
| tctccctca cagggtcag ggctcagggc tcaagtctca gaacaaatgg cagaggccag | 11580 |
| tgagcccaga gatggtgaca gggcaatgat ccaggggcag ctgcctgaaa cgggagcagg | 11640 |
| tgaagccaca gatgggagaa gatggttcag gaagaaaaat ccaggaatgg gcaggagagg | 11700 |
| agaggaggac acaggctctg tggggctgca gccaggatg ggactaagtg tgaagacatc | 11760 |
| tcagcaggtg aggccaggtc ccatgaacag agaagcagct cccacctccc ctgatgcagc | 11820 |
| gacacacaga gtgtgtggtg ctgtgcccc agagtggggc tctctgttc tgggtccccag | 11880 |
| ggagtgaaga gtgagggtga cttgtccctg ctctctctg ctaccccaac attcaccttc | 11940 |

FIGURE 14H

| | |
|---|-------|
| tctcatgcc cctctctctc aaatatgatt tggatctatg tccccgcca aatctcatgt | 12000 |
| caaattgtaa accccaatgt tggaggtggg gccttgtgag aagtgattgg ataatgcggg | 12060 |
| tggattttct gctttgatgc tgtttctgtg atagagatct cacatgatct ggttgtttaa | 12120 |
| aagtgtgtag cacctctccc ctctctctct ctctctctta ctcatgctct gccatgtaag | 12180 |
| acgttctgtt ttccccctca ccgtccagaa tgattgtaag ttttctgagg cctccccagg | 12240 |
| agcagaagcc actatgcttc ctgtacaact gcagaatgat gagcgaatta aacctctttt | 12300 |
| ctttataaat taccagctct caggtatttc tttatagcaa tgcgaggaca gactaataca | 12360 |
| atcttctact ccagatccc cgcacacgct tagccccaga catcactgcc cctgggagca | 12420 |
| tgcacagcgc agcctcctgc cgacaaaagc aaagtcacaa aaggtgacaa aaatctgcat | 12480 |
| ttggggacat ctgattgtga aagagggagg acagtacact tgtagccaca gagactgggg | 12540 |
| ctcaccgagc tgaaacctgg tagcactttg gcataacatg tgcatacccc gtgttcaatg | 12600 |
| tctagagatc agtgttgagt aaaacagcct ggtctggggc cgctgctgtc cccacttccc | 12660 |
| tctgtccac cagagggcgg cagagttcct cccaccctgg agcctcccca ggggctgctg | 12720 |
| acctccctca gccgggcccc cagcccagca gggtcacccc tcaccgggt cacctcgccc | 12780 |
| cacgtcctcc tcgccctccg agctcctcac acggactctg tcagctcctc cctgcagcct | 12840 |
| atcgccgcc cacctgaggc ttgtcgccg cccacttgag gcctgtcggc tgccctctgc | 12900 |
| aggcagctcc tgtcccctac acccctcct tccccgggct cagctgaaag ggcgtctccc | 12960 |
| agggcagctc cctgtgatct ccaggacagc tcagtctctc acaggctccg acgcccccta | 13020 |
| tgtgttcacc tcacagccct gtcattacca ttaactcctc agtcccatga agttcactga | 13080 |
| gcgcctgtct cccggttaca ggaaaactct gtgacaggga ccacgtctgt cctgctctct | 13140 |
| gtggaatccc agggcccagc ccagtgcctg acacggaaca gatgctccat aaatactggt | 13200 |
| taaatgtgtg ggagatctct aaaaagaagc atatcacctc cgtgtggccc ccagcagtca | 13260 |
| gagtctgttc catgtggaca caggggcact ggcaccagca tgggaggagg ccagcaagtg | 13320 |
| cccgcggctg cccaggaat gaggcctcaa ccccagagc ttcagaaggg aggacagagg | 13380 |
| cctgcaggga atagatcctc cggcctgacc ctgcagccta atccagagtt cagggtcagc | 13440 |
| tcacaccagc tcgaccctgg tcagcatccc tagggcagtt ccagacaagg ccggaggtct | 13500 |
| cctottgccc tcagggggt gacattgcac acagacatca ctcaggaaac ggattccccct | 13560 |
| ggacaggaac ctggctttgc taaggaagtg gaggtggagc ctggtttcca tcccttgctc | 13620 |

FIGURE 14I

| | |
|---|-------|
| caacagaccc ttctgatctc tcccacatac ctgctctgtt cttttctggg tcctatgagg | 13680 |
| accctgttct gccaggggtc cctgtgcaac tccagactcc ctctgtgtac caccatgggg | 13740 |
| aaggtgggggt gatcacagga cagtcagcct cgcagagaca gagaccaccc aggactgtca | 13800 |
| gggagaacat ggacaggccc tgagccgcag ctacagccaac agacacggag agggaggggtc | 13860 |
| cccctggagc cttccccaag gacagcagag cccagagtca cccacctccc tccaccacag | 13920 |
| tcctctcttt ccaggacaca caagacacct cccctccac atgcaggatc tggggactcc | 13980 |
| tgagacctct gggcctgggt ctccatccct gggtcagtgg cggggttgggt ggtactggag | 14040 |
| acagaggggt ggtccctccc cagccaccac ccagttagcc tttttctagc cccagagcc | 14100 |
| acctctgtca ccttctgtt gggcatcatc ccacctccc agagccctgg agagcatggg | 14160 |
| gagacccggg accctgctgg gtttctctgt cacaaaggaa aataatcccc ctggtgtgac | 14220 |
| agacccaagg acagaacaca gcagaggtca gcactgggga agacagggtt tcctcccagg | 14280 |
| ggatgggggt ccatccacct tgccgaaaag atttgtctga ggaactgaaa atagaaggga | 14340 |
| aaaaagagga gggacaaaag aggcagaaat gagagggggag gggacagagg acacctgaat | 14400 |
| aaagaccaca cccatgaccc acgtgatgct gagaagtact cctgccctag gaagagactc | 14460 |
| agggcagagg gaggaaggac agcagaccag acagtcacag cagccttgac aaaacgttcc | 14520 |
| tggaaactcaa gctcttctcc acagaggagg acagagcaga cagcagagac catggagtct | 14580 |
| ccctcgcccc ctccccacag atggtgcac cctggcaga ggctcctgct cacaggtgaa | 14640 |
| gggaggacaa cctgggagag ggtgggagga gggagctggg gtctcctggg taggacaggg | 14700 |
| ctgtgagacg gacagagggc tcctgttgga gcctgaatag ggaagaggac atcagagagg | 14760 |
| gacaggagtc acaccagaaa aatcaaattg aactggaatt ggaaaggggc aggaaaacct | 14820 |
| caagagttct attttcctag ttaattgtca ctggccacta cgtttttaaa aatcataata | 14880 |
| actgcatcag atgacacttt aaataaaaac ataaccaggg catgaaacac tgtcctcatc | 14940 |
| cgctaccgc ggacattgga aaataagccc caggctgtgg agggccctgg gaaccctcat | 15000 |
| gaactcatcc acaggaatct gcagcctgtc ccaggcactg gggtgcaacc aagatc | 15056 |

FIGURE 15A

aagcttctag ttttcttttc ccggtgacat cgtggaaagc actagcatct ctaagcaatg 60
atctgtgaca atattcacag tgtaatgcca tccagggaaac tcaactgagc cttgatgtcc 120
agagattttt gtgttttttt ctgagactga gtctcgctct gtgccaggct ggagtgcagt 180
ggtgcaacct tggctcactg caagctccgc ctctggggtt cagccattc tctgcctca 240
gcctcctgag tagctgggac tacaggcacc cgccaccacg cctggctaata ttttttgtat 300
ttttagtaga gatgggggtt cactgtgtta gccaggatgg tctcagtctc ctgacctcgt 360
gatctgcccc ccttggcctc ccaaagtgtc gggatgacag gcgtgagcca ccgcgcctgg 420
ccgatatcca gagatttttt ggggggctcc atcacacaga catgttgact gtcttcatgg 480
ttgactttta gtatccagcc cctctagaaa tctagctgat atagtgtggc tcaaaaactt 540
gagcacaaat cacaccgtta gactatctgg tgtggcccaa accttcaggt gaacaaaggg 600
actctaattc ggcaggatat tccaaagcat tagagatgac ctcttgcaaa gaaaaagaaa 660
tggaaaagaa aaagaaagaa agggaaaaaa aaaaaaaaaa gagatgacct ctcaggctct 720
gaggggaaac gcctgaggtc tttgagcaag gtcagtctc tgttgacag tctccctcac 780
agggtcattg tgacgatcaa atgtggtcac gtgtatgagg caccagcaca tgacctggctc 840
tggggagtgc cgtgtaagtg tatgcttgca ctgctgaatg cttgggatgt gtcagggatt 900
atcttcagca cttacagatg ctcatctcat cctcacagca tcactatggg atgggtatta 960
ctggcctcat ttgatggaga aagtggctgt ggctcagaaa ggggggacca ctagaccagg 1020
gacactctgg atgctgggga ctccagagac catgaccact caccaactgc agagaaatta 1080
attgtggcct gatgtccctg tcctggagag ggtggagggtg gaccttact aacctctac 1140
cttgaccctc tcttttaggg ctctttctga cctccaccat ggtactagga cccattgta 1200
ttctgtacct tcttgactct atgaccccca ctgcccactg catccagctg ggtcccctcc 1260
tatctctatt ccagctggc cagtgcagtc tcagtcccc cctgtttgtc agtaactctg 1320
aaggggctga cattttactg acttgcaaac aaataagcta actttccaga gttttgtgaa 1380
tgctggcaga gtccatgaga ctctgagtc agaggcaaag gcttttactg ctcacagctt 1440
agcagacagc atgaggttca tgttcacatt agtacacctt gccccccca aatctttag 1500
ggtgaccaga gcagtctagg tggatgctgt gcagaagggg tttgtgccac tggtgagaaa 1560
cctgagatta ggaatcctca atcttatact gggacaactt gcaaactgc tcagcctttg 1620
tctctgatga agatattatc ttcatgatct tggattgaaa acagacctac tctggaggaa 1680

FIGURE 15B

catattgtat cgattgtcct tgacagtaaa caaatctgtt gtaagagaca ttatctttat 1740
 tatctaggac agtaagcaag cctggatctg agagagatat catcttgcaa ggatgcctgc 1800
 tttaaaaca tccttgaaac aacaatccag aaaaaaaaaag gtgttgctgt ctttgctcag 1860
 aagacacaca gatacgtgac agaaccatgg agaattgcct cccaacgctg ttcagccaga 1920
 gccttcacc cttgtctgca ggacagtctc aacgttccac cattaataac ttcttctatc 1980
 acatcctgct tctttatgcc taaccaaggt tctagggtccc gatcgactgt gtctggcagc 2040
 actccactgc caaaccaga ataaggcagc gctcaggatc ccgaaggggc atggctgggg 2100
 atcagaactt ctgggtttga gtgaggagt ggtccaccct cttgaatttc aaaggaggaa 2160
 gaggtggat gtgaaggtac tgggggaggg aaagtgtcag ttccgaactc ttaggtcaat 2220
 gagggaggag actggttaagg tcccagctcc cgaggtactg atgtgggaat ggcctaagaa 2280
 tctcatatcc tcaggaagaa ggtgctggaa tcctgagggg tagagttctg ggtatatttg 2340
 tggcttaagg ctctttggcc cctgaaggca gaggtggaa ccattaggtc cagggtttgg 2400
 ggtgatagta atgggatctc ttgattcctc aagagtctga ggatcgaggg ttgcccattc 2460
 ttccatcttg ccacctaatc cttactccac ttgaggggtat caccagccct tctagctcca 2520
 tgaagggtccc ctgggcaagc acaatctgag catgaaagat gccccagagg ccttgggtgt 2580
 catccaetca tcattccagca tcacactctg aggggtgtggc cagcaccatg acgtcatgtt 2640
 gctgtgacta tcctgcagc gtgcctctcc agccacctgc caaccgtaga gctgcccattc 2700
 ctctctggt gggagtggcc tgcattggtc caggctgagg cctagtgtca gacagggagc 2760
 ctggaatcat agggatccag gactcaaaag tgctagagaa tggccatatg tcaccatcca 2820
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 ctattgctct cccaagttag tctcccagat acgaggcact gtgccagcat cagccttattc 2940
 tccaccacat cttgtaaaag gactaccag ggcctgatg aacaccatgg tgtgtacagg 3000
 agtagggggg ggaggcacgg actcctgtga ggtcacagcc aaggagagcat catcatgggt 3060
 ggggaggagg caatggacag gcttgagaac ggggatgtgg ttgtatttg ttttctttgg 3120
 ttagataaag tgctgggtat aggattgaga gtggagtatg aagaccagtt aggatggagg 3180
 atcagattgg agttgggtta gataaagtgc tgggtatagg attgagagtg gagtatgaag 3240
 accagttagg atggaggatc agattggagt tgggttagag atggggtaaa attgtgctcc 3300
 ggatgagttt gggattgaca ctgtggaggt ggtttgggat ggcatggctt tgggatggaa 3360

FIGURE 15C

atagatttgt tttgatgttg gctcagacat ccttggggat tgaactgggg atgaagctgg 3420
gtttgatttt ggaggtagaa gacgtggaag tagctgtcag atttgacagt ggccatgagt 3480
tttgtttgat ggggaatcaa acaatggggg aagacataag gggttggttg ttaggttaag 3540
ttgcgttggg ttgatggggg cggggctgtg tataatgcag ttggattggg ttgtattaaa 3600
ttgggttggg tcagggttttg gttgaggatg agttgaggat atgcttgggg acaccggatc 3660
catgagggtc tcaactggagt ggagacaaac ttcctttcca ggatgaatcc agggaagcct 3720
taattcacgt gtaggggagg tcaggccact ggctaagtat atccttcac tccagctcta 3780
agatggtctt aaattgtgat tatctataac cacttctgtc tccctcactg tgcttggagt 3840
ttacctgatc actcaactag aaacagggga agattttatc aaattctttt tttttttttt 3900
ttttttttga gacagagtct cactctgttg cccaggctgg agtgcagtgg cgcagtctcg 3960
gctcactgca acctctgcct cccaggttca agtgattctc ctgcctcagc ctctgagtt 4020
gctgggatta caggcatgca gcaccatgcc cagctaattt ttgtattttt agtagagatg 4080
gggtttcacc aatgtttgcc aggctggcct cgaactcctg acctggtgat ccacctgcct 4140
cagcctccca aagtgtctggg attacaggcg tcagccaccg cgcccagcca cttttgtcaa 4200
attcttgaga cacagctcgg gctggatcaa gtgagctact ctggttttat tgaacagctg 4260
aaataaccaa ctttttgga attgatgaaa tcttacggag ttaacagtgg aggtaccagg 4320
gctcttaaga gttcccgatt ctcttctgag actacaaatt gtgattttgc atgccacctt 4380
aatctttttt tttttttttt taaatcgagg ttccagtctc attctatttc ccaggctgga 4440
gttcaatagc gtgatcacag ctcaactgtg ccttgaactc ctggccttaa gagattctcc 4500
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tgagatgggt ggatcacgag gtcaggagtt tgagaccagc ctgaccaaca tggtgaaaact 4680
ctgtctctac taaaaaaaaa aaaaatagaa aaattagccg ggcgtggtgg cacacggcac 4740
ctgtaatccc agctactgag gaggtgagg caggagaatc acttgaacc agaaggcaga 4800
ggttgcaatg agccgagatt gcgccactgc actccagcct gggtgacaga gtgagactct 4860
gtctcaaaaa aaaaaaattt tttttttttt tttgtagaga tggatcttgc tttgtttctc 4920
tggttggcct tgaactcctg gcttcaagtg atcctcctac cttggcctcg gaaagtgttg 4980
ggattacagg cgtgagccac catgactgac ctgtcgtaa tcttgaggta cataaacctg 5040
gctcctaaag gctaaaggct aaatatttgt tggagaaggg gcattggatt ttgcatgagg 5100

FIGURE 15D

atgattctga cctgggaggg caggtcagca ggcattctctg ttgcacagat agagtgtaca 5160
ggtctggaga acaaggagtg gggggttatt ggaattccac attgtttgct gcacgttgga 5220
ttttgaaatg ctagggaact ttgggagact catatttctg ggctagagga tctgtggacc 5280
acaagatctt tttatgatga cagtagcaat gtatctgtgg agctggattc tgggttgga 5340
gtgcaaggaa aagaatgtac taaatgccaa gacatctatt tcaggagcat gaggaataaa 5400
agttctagtt tctggtctca gagtgggtgca gggatcaggg agtctcaca tctcctgagt 5460
gctggtgtct tagggcacac tgggtcttgg agtgcaaagg atctaggcac gtgaggcttt 5520
gtatgaagaa tcggggatcg taccaccccc ctgtttctgt ttcactctgg gcatgtctcc 5580
tctgcctttg tccctagat gaagtctcca tgagctacaa gggcctggtg catccaggg 5640
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ccccagcccc aagctt 5836

FIGURE 16A

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 attgcgctca cgattggctt gaagaagcaa ggactgtggg aggtgggctt tgtagtaaca 300
 agagggcagg gtgaactctg attcccatgg gggaatgtga tggtcctgtt acaaattttt 360
 caagctggca gggaataaaa cccattacgg tgaggacctg tggagggcgg ctgccccaac 420
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 agaagccttt gagacccttt aggttacaag tactgaggca gcaaataaaa tgaaatctta 540
 tttttcaact ttatactgca tgggtgtgaa gatataattg tttctgtaca gggggtgagg 600
 gaaaggaggg gaggaggaaa gttcctgcag gtctggtttg gtcttgtgat ccaggggggtc 660
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 ttgttacata ggtaaactgt tgccatggtg gtttgctgta cctatcaacc catcacctag 840
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FIGURE 16B

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FIGURE 16C

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FIGURE 16D

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FIGURE 16E

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FIGURE 16F

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FIGURE 16G

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FIGURE 16H

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FIGURE 17

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FIGURE 18

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ctgcaccttg tcagtgaagt ccagatacct acag 454

seq. data used only when necessary for the purpose of this report

| | |
|---|-----|
| g atg acc ggc tca acc atc gcg ccc aca acg gac tat cgc aac acc act | 49 |
| Met Thr Gly Ser Thr Ile Ala Pro Thr Thr Asp Tyr Arg Asn Thr Thr | |
| 1 5 10 15 | |
| gct acc gga cta aca tct gcc cta aat tta ccc caa gtt cat gcc ttt | 97 |
| Ala Thr Gly Leu Thr Ser Ala Leu Asn Leu Pro Gln Val His Ala Phe | |
| 20 25 30 | |
| gtc aat gac tgg gcg agc ttg gac atg tgg tgg ttt tcc ata gcg ctt | 145 |
| Val Asn Asp Trp Ala Ser Leu Asp Met Trp Trp Phe Ser Ile Ala Leu | |
| 35 40 45 | |
| atg ttt gtt tgc ctt att att atg tgg ctt att tgt tgc cta aag cgc | 193 |
| Met Phe Val Cys Leu Ile Ile Met Trp Leu Ile Cys Cys Leu Lys Arg | |
| 50 55 60 | |
| aga cgc gcc aga ccc ccc atc tat agg cct atc att gtg ctc aac cca | 241 |
| Arg Arg Ala Arg Pro Pro Ile Tyr Arg Pro Ile Ile Val Leu Asn Pro | |
| 65 70 75 80 | |
| cac aat gaa aaa att cat aga ttg gac ggt ctg aaa cca tgt tct ctt | 289 |
| His Asn Glu Lys Ile His Arg Leu Asp Gly Leu Lys Pro Cys Ser Leu | |
| 85 90 95 | |
| ctt tta cag tat gat taa | 307 |
| Leu Leu Gln Tyr Asp | |
| 100 | |

FIGURE 19